REMARKS

In the Office Action dated May 13, 2003, claims 1-19 are pending. Claims 10-13 are withdrawn from consideration as drawn to non-elected subject matter. Claim 19 is objected to under 37 C.F.R. §1.75(c) as allegedly being in improper form. Claims 4-6 are objected to allegedly because these claims recite non-elected subject matter. Claims 9, 15-16 and 19 are rejected under 35 U.S.C. §101 as allegedly drawn to non-statutory subject matter. Claims 1-5 are rejected under 35 U.S.C. §112, first paragraph, for allegedly lacking enabling support in the specification. Claims 9, 15-16 and 19 are rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite. Claims 1-4, 8-9, and 14-19 are rejected under 35 U.S.C. §102(b) as allegedly anticipated by Miljanich et al. (U.S. Patent No. 5,424,218). In addition, the Examiner has objected to the specification for certain alleged informalities.

This Response addresses each of the Examiner's rejections and objections. Applicants therefore respectfully submit that the present application is in condition for allowance. Favorable consideration of all pending claims is therefore respectfully requested.

In the Office Action, the Examiner states that the listing of references in the specification at page 40, line 10 to page 43, line 8, is not a proper information disclosure statement.

Applicants acknowledges that, unless the references have been cited by the Examiner on form PTO-892 or by Applicants on PTO-1449, the references cited in the specification at page 40, line 10 to page 43, line 8, will not be considered.

The Examiner further states that the references previously submitted by Applicants have been placed in the file, but have not been made of record, because the references were not accompanied by the appropriate form.

Applicants respectfully submit that an appropriate Information Disclosure Statement (IDS) was mailed on January 17, 2001, together with copies the references and Form PTO-1449. Applicants are providing herewith a copy of the IDS and a copy of Form PTO-1449, as filed on January 17, 2001. Applicants respectfully request that the references submitted on January 17, 2001 be made of record and given consideration.

The Examiner has also objected to the specification for certain alleged informalities. In the first instance, the Examiner states that the sequences disclosed at page 30, line 24 and page 31, lines 9-10 of the specification, are not identified with their corresponding sequence identifiers. In this regard, Applicants respectfully direct the Examiner's attention to the Preliminary Amendment mailed on July 9, 2001, in which certain pages of the specification, including pages 30-31, have been amended to insert appropriate sequence identifiers. Applicants are providing herewith clean copies of the amended pages 30-31, as filed in the Preliminary Amendment on July 9, 2001.

The Examiner has also pointed out a typographical error at page 31, line 10 of the specification. Applicants have amended the specification to replace the term "*Tag*" with the term "*Taq*".

The Examiner further points out that trademarks used in the specification should be capitalized and accompanied by the generic terminology. Applicants have amended the specification to identify trademarks in capital letters and to add generic terms after the trademarks where such terms are missing.

In view of the foregoing, the objection to the specification is obviated. Withdrawal of the objection is therefore respectfully requested.

Claim 19 is objected to under 37 C.F.R. §1.75(c) as being in improper form. The Examiner states that a multiple dependent claim should refer to other claims in the alternative only.

Applicants have amended claim 19 to depend from claim 1 only. As such, the objection to claim 19 is overcome and withdrawal thereof is respectfully requested.

Claims 4-6 are objected to allegedly because these claims recite non-elected subject matter.

It is observed that claims 4-6 ultimately depend on claim 1 and are drawn to ω-conotoxin peptides characterized by certain specified sequences including SEQ ID NO: 5 (claims 5-6), or certain specified sequences in the second loop of the peptide (claim 4). Although Applicants have elected SEQ ID NO: 5 as the peptide species for continued prosecution, SEQ ID NO: 5 and other peptides encompassed by claims 4-6 are all related to each other as isolated synthetic or recombinant ω-conotoxin peptides, which share the same features as delineated in claim 1, e.g., having the fourth loop sequence as set out in SEQ ID NO: 1. Applicants respectfully submit that, because the generic claim (i.e., claim 1) is patentable (as further submitted hereinbelow), Applicants should not be required to restrict the claims to only SEQ ID NO: 5. Therefore, withdrawal of the objection to claims 4-6 is respectfully requested.

Claims 9, 15-16 and 19 are rejected under 35 U.S.C. §101 as allegedly drawn to non-statutory subject matter. The Examiner states that these claims recite a use of an isolated ω-conotoxin peptide without setting forth any steps involved in the process, which is not a proper process claim under 35 U.S.C. §101.

In response, Applicants have canceled claims 15-16 without prejudice. Claims 9 and 19 have been rewritten as method claims with respective method steps. Support for claims 9 and 19, as presently amended, is found in the specification, e.g., at pages 15-16. No new matter is introduced. As such, the rejection of claims 9, 15-16 and 19 under 35 U.S.C. §101 is overcome. Withdrawal of the rejection is therefore respectfully requested.

Claims 1-5 are rejected under 35 U.S.C. §112, first paragraph, for allegedly lacking enabling support in the specification. The Examiner admits that the specification is enabling for the disclosed peptides of SEQ ID NOs: 5-7, 14-31, and for ω-conotoxins that bind to calcium channels and contain the subsequences SEQ ID NOs: 1-2. However, the Examiner contends that the specification does not reasonably provide enablement for ω-conotoxins comprising one or more conservative amino acids or side chain modifications to SEQ ID NO: 1, as presently claimed.

More specifically, the Examiner contends that one could theoretically substitute all of the amino acids of SEQ ID NO: 1, so that a peptide encompassed by the claim would have no sequence similarity with any of the recited sequences. The Examiner acknowledges the definition of conservative substitutions on page 3, lines 1-24 of the specification. However, the Examiner contends that the definition is not limiting. Furthermore, the Examiner observes that claims 1-4 and 14 do not recite any functional properties of the claimed ω-conotoxin peptides, such as specific binding to calcium channels. In addition, the Examiner points out that the instant claims do not specify, for example, that SEQ ID NO: 1 is directly adjacent to a cysteine at both its NH_2 and the COOH terminus. Therefore, the Examiner concludes that the scope of the claims is broader than the disclosure, and that undue experimentation would be required in order to determine whether a specific peptide or protein falls within the scope of the claims.

In the first instance, Applicants respectfully disagree with the Examiner's characterization that the present claims encompass peptides that have no sequence similarity with any of the recited sequences. Claim 1-5 are drawn to ω-conotoxin peptides comprising a fourth loop between cysteine residues 5 and 6 which comprises SEQ ID NO: 1, or such a sequence (in the fourth loop) which has undergone one or more conservative amino acid substitutions or side chain modifications. As described in the specification, e.g., at page 1, lines 16 to 23, and as well-understood by those skilled in the art, ω-conotoxin peptides are characterized by having six cysteine residues and a characteristic pattern of disulfide bonds formed among the cysteine residues. By virtue of this structure, all ω-conotoxin peptides present four amino acid loops, as described on page 1, lines 21 to 23. As the specification clearly describes these characteristics of ω-conotoxin peptides and because one skilled in the art would understand that ω-conotoxin peptides would have these characteristics, Applicants do not believe that it is necessary to include these characteristics in the claims.

Furthermore, Applicants respectfully submit that the specification provides an adequate number of examples of ω-conotoxin peptides having a fourth loop comprising SEQ ID NO: 1. See, for example, SEQ ID NOs. 6, 7 and 14 to 32. The specification also provides a detailed teaching in relation to the synthesis of such peptides, the activity of such peptides and their formulation and use. See, e.g., pages 17-18. The specification also provides ample guidance, e.g., at pages 3 and 4, with respect to the type of amino acid substitutions or side chain modifications which could be made to SEQ ID NO: 1 and which would be considered conservative.

Accordingly, Applicants respectfully submit that the specification provides adequate guidance for the ω-conotoxin peptides, as presently claimed. Applicants have also added

claimed 20, to further delineate the features of the claimed ω-conotoxin peptides. Specifically, the ω–conotoxin peptide of claim 20 is characterized functionally by its ability to bind to voltage sensitive calcium channels, and characterized structurally by having six Cysteine residues, wherein the fourth loop between cysteine residues 5 and 6 comprises the amino acid sequence as set forth in SEQ ID NO: 1 or such a sequence which has undergone one or more conservative amino acid substitutions or side chain modifications, and wherein SEQ ID NO: 1 is directly adjacent to a cysteine at both its NH2 and the COOH terminus. Support for claim 20 is found throughout the specification, e.g., at page 1, lines 16-23, and page 3, lines 1-8.

In view of the foregoing, Applicants respectfully submit that the rejection of claims 1-5 under the enablement requirement of 35 U.S.C. §112, first paragraph, is overcome. Withdrawal of the rejection is therefore respectfully requested.

Claims 9, 15-16 and 19 are rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite. More specifically, the Examiner states that claims 9, 15-16 and 19 are drawn to the use of a conotoxin peptide, but do not set forth any steps involved in the use process. In addition, the Examiner objects to the term "VSCC" as vague.

Applicants respectfully submit the rejection of claims 15-16 is rendered moot in view of cancellation of these claims. Applicants further respectfully submit that claims 9 and 19, as presently amended, are not indefinite. Withdrawal of the rejection 35 U.S.C. §112, second paragraph is therefore respectfully requested.

Claims 1-4, 8-9 and 14-19 are rejected under 35 U.S.C. §102(b) as allegedly anticipated by Miljanich et al. (U.S. Patent No. 5,424,218).

The Examiner contends that Miljanich et al. teach the use of ω-conotoxins, including MVIIIA, in blocking voltage-gated calcium channels, in the treatment of neuronal

damage related to ischemia, and in methods for screening compounds which bind to calcium channels. The Examiner contends that MVIIIA is derived from SEQ ID NO:1 by substitution and contains SKLMYD (SEQ ID NO:2) in its second loop.

In response, Applicants respectfully submit that it is impossible to arrive at the fourth loop of the ω-conotoxins described by Miljanich et al. by making one or more conservative amino acid substitutions or side chain modifications to SEQ ID NO: 1. Applicants respectfully direct the Examiner's attention to the fact that the fourth loop of MVIIA has only four amino acid residues (i.e., RSGK). In contrast, the ω-conotoxin peptides, as presently claimed, contain a fourth loop comprising SGTVGR (SEQ ID NO: 1) (i.e., six residues) or such a sequence which has undergone one or more conservative amino acid substitutions or side chain modifications (see independent claim 1). Therefore, the instantly claimed ω-conotoxin peptides do not include a ω-conotoxin peptide with a fourth loop having only four amino acids. Applicants further submit that claim 3 recites additions and deletions of amino acids with respect to the first, second and third loops of the ω-conotoxin peptides. Since this claim is dependent from claim 1, the delineation in claim 1, i.e., wherein the fourth loop comprises SGTVGR (SEQ ID NO: 1) or such a sequence which has undergone one or more conservative amino acid substitutions or side chain modifications, also applies.

Therefore, it is respectfully submit that Miljanich et al. do not teach the presently claimed ω-conotoxin peptides or the use thereof. Accordingly, the rejection under 35 U.S.C. §102(b) is overcome and withdrawal thereof is respectfully requested.

In view of the foregoing amendments and remarks, it is firmly believed that the subject application is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,

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Encls.:
copies of IDS and PTO-1449;
copies of amended pages 30-31 of the specification.